ABRITES DIAGNOSTICS

for

Toyota/Lexus/Scion

User Manual

INTRODUCTION 3
SYSTEM REQUIREMENTS 4
GETTING STARTED 5
BASIC DIAGNOSTIC 7
VEHICLE SELECTION 10
SPECIAL FUNCTIONS 11
APPENDIX 24

INTRODUCTION

Congratulations on choosing our wonderful product!
“Abrites Diagnostics for Toyota/Lexus/Scion” is a Windows PC based diagnostic software for Toyota, Lexus and Scion vehicles. With the help of this software you can perform complete diagnostic operations of all vehicles.

For proper operation of your diagnostic software you will need a corresponding interface for connection between your PC and vehicle named “AVDI”.

AVDI is an interface produced by ABRITUS 72 Ltd. intended to act as an interface between the PC and the electronic control units.

AVDI should be used with ABRITES software produced by Abritus 72 Ltd.

ABRITES is a trade mark of Abritus 72 Ltd.

1.1 Scope of the manual

This document describes the usage of Abrites Diagnostics for Toyota/Lexus/Scion.
The document is applicable for the software versions 4.0 or newer.

In this manual we suppose that software for your AVDI interface is already installed.
Please refer “AVDI Common User’s Manual” in case it is not.

SYSTEM REQUIREMENTS

System requirements:

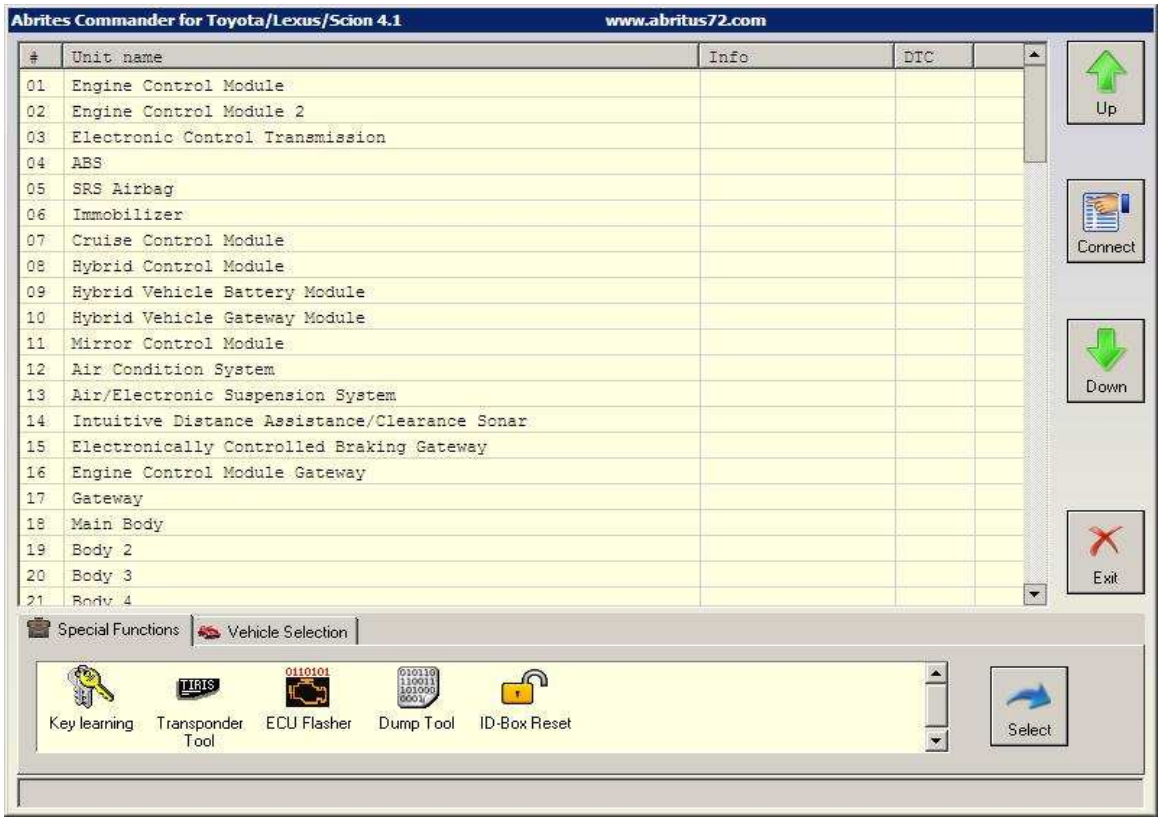
- Operation system Windows XP, Windows 2000, Windows Vista, Windows 7
- At least Pentium 4 with 512 MB RAM.

Note: Windows RT is not supported!

GETTING STARTED

You can start Abrites Diagnostics for Toyota/Lexus/Scion by starting the Abrites Quick Start application and selecting Toyota, Lexus or Scion.

When the diagnostic application is started the main screen of the application will appear – picture 1.

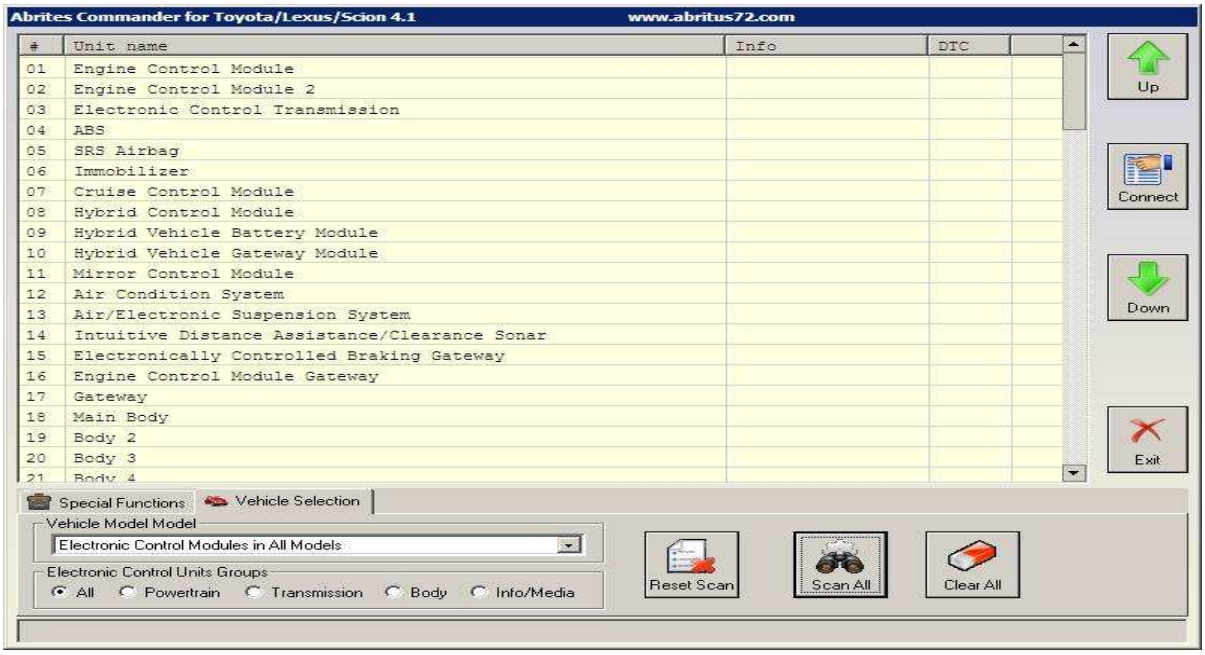


Picture 1

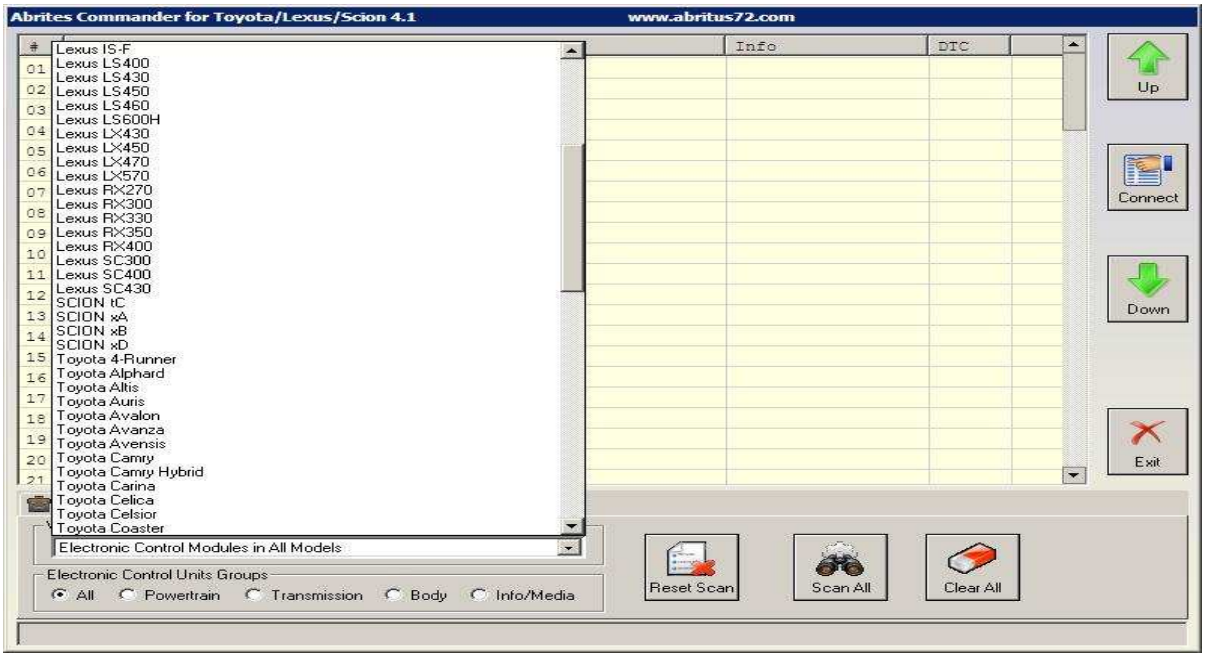
The screen is divided in two parts – the upper part where all electronic control units assembled in Toyota, Lexus or Scion vehicles are listed and the lower part of the screen where the additional special functionalities available in your diagnostic software are listed.

The lower part of the main screen can be used for selection of a vehicle model and group of electronic control units displayed in the upper part of the main screen – picture 2a,2b.

Displayed functionality on the lower part of the screen can be exchanged by pressing the Special Functions or Vehicle Selection tabs.



Picture 2a



Picture 2b

By double-clicking on the desired electronic control unit the user can establish a diagnostic session with the corresponding control unit.

Once a unit is selected by the list the user can move the selection up and down in the list by using the buttons

and

.

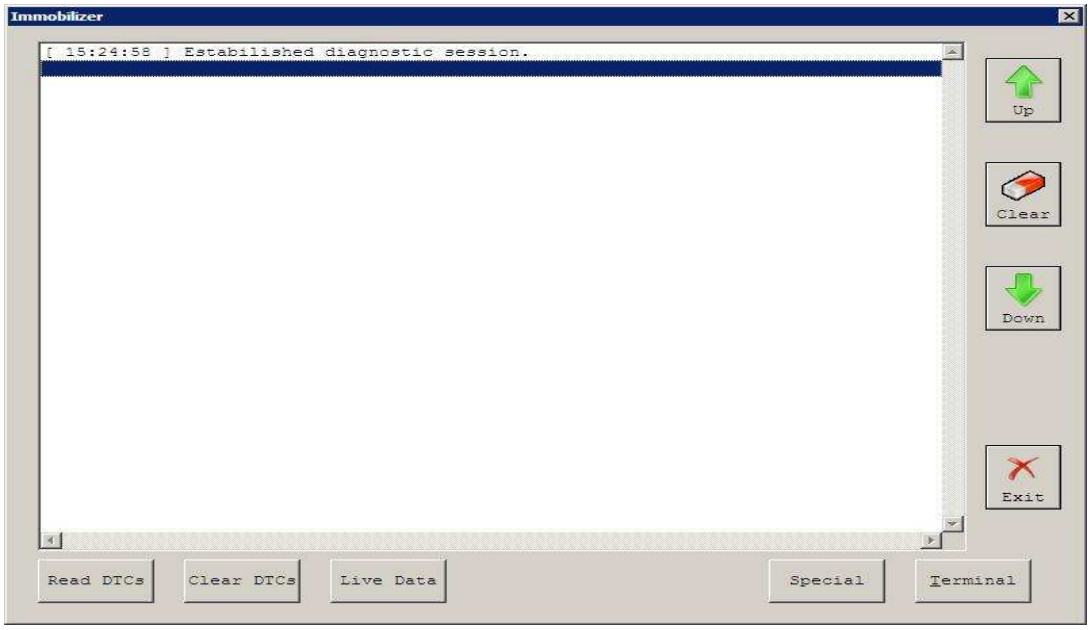
The button

will establish a diagnostic session with the currently selected electronic control unit.

BASIC DIAGNOSTIC

As described you can establish a diagnostic session with most electronic control units in the vehicle.

When the diagnostic session is established the basic diagnostic screen will appear (picture 3)



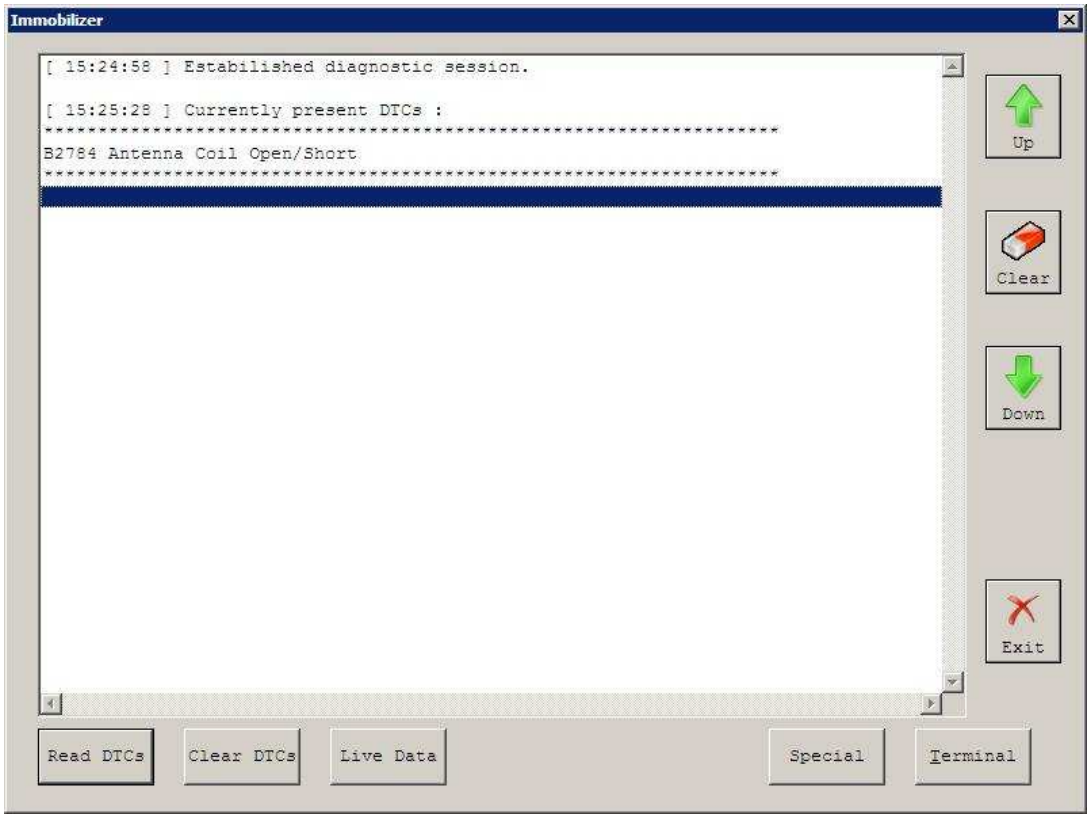
Picture 3

If for some reason the diagnostic session can not be established you will be notified.

In the basic diagnostic screen you have a choice to read registered DTCs, clear them, display live data or to perform other actions from the “Special” button.

To read all DTCs press the button “Read DTCs” - all DTCs with their status – current, history or pending will be displayed.

Each DTCs is described with its number (Uxxxx, Bxxxx or Cxxxx) and with a detailed description – picture 4.



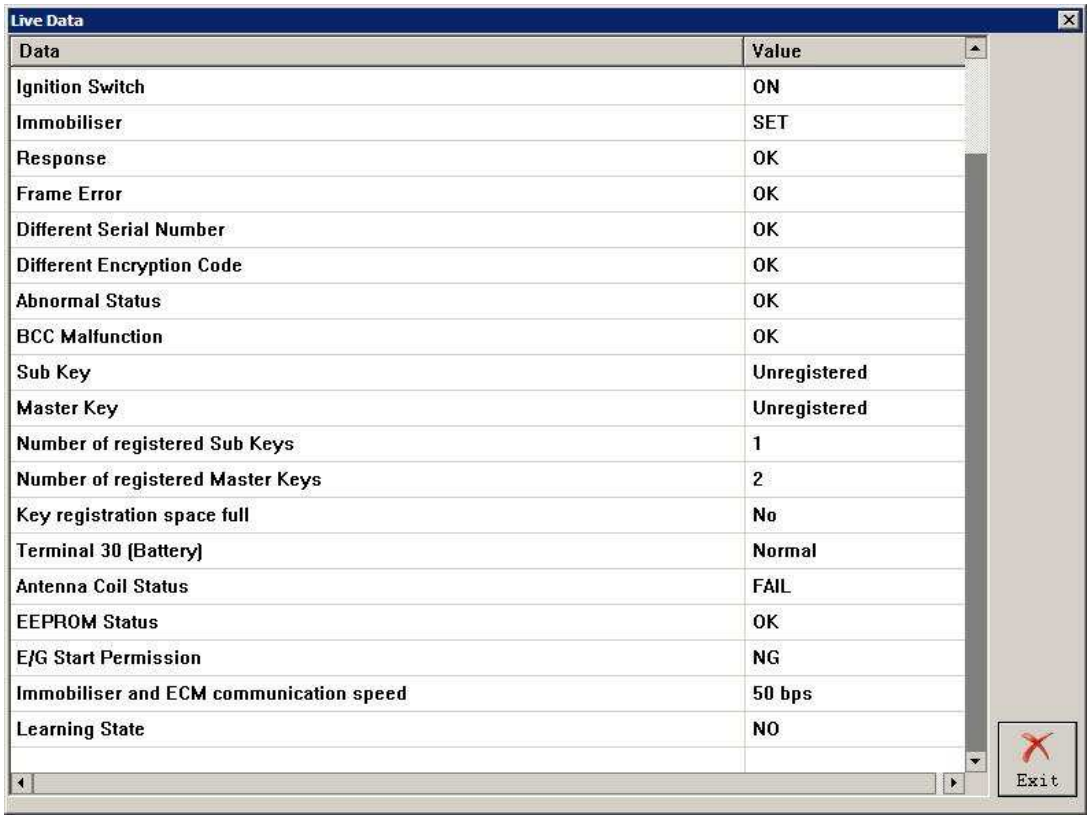
Picture 4

To clear stored DTCs in the electronic control unit press button “Clear DTCs”.

Live data or so named measured values is data sampled by the electronic control units giving us a detailed view of the current status of the corresponding unit.

Simply press the “Live Data” button and everything available from the current unit will be displayed – Picture 5.

A list with the units where live data is available is present in appendix A.

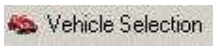


Picture 5

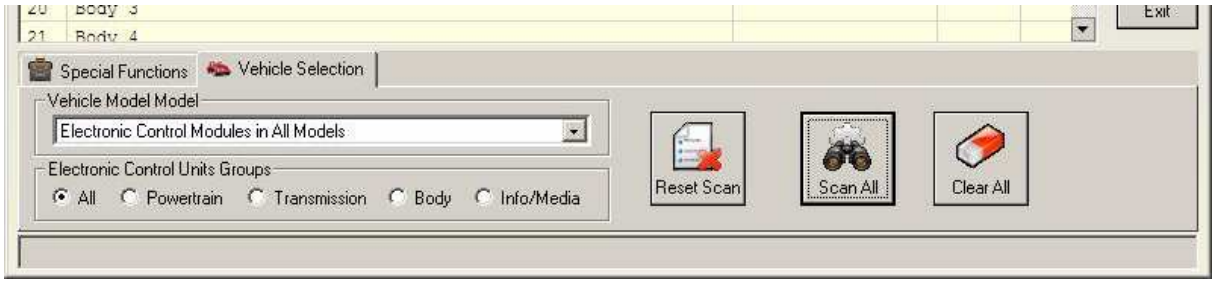
Your diagnostic tool can provide you with a wide range of additional special diagnostic procedures available by pressing the button “Special”.

In the appendix “B” a list of currently available special functions depends selected unit is present.

VEHICLE SELECTION

By selecting the 

tab placed on the main screen of your Abrites Diagnostics for Toyota/Lexus/Scion you will have an option to select the exact model of your vehicle or group of electronic control units. These options are useful to you because they will reduce the amount of displayed electronic control units on the screen. Additionally this amount can be reduced by clarification of control unit purpose group – power train, transmission, body and infotainment.



Once the set of displayed units is defined you can perform the following actions for the units on the list:

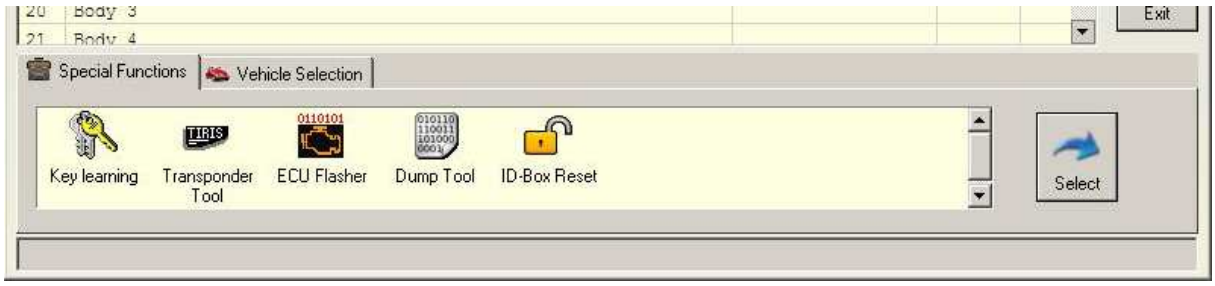
- Check availability and DTCs for all units from the list (SCAN) – press button

- Clear all DTCs in the list – press button

- Reset SCAN data in the list – press button

SPECIAL FUNCTIONS

The ABRITES Diagnostics for Toyota/Lexus/Scion has some unique diagnostic abilities, which are not supported by other diagnostic tools. These functions are accessible from the Special Functions tab on the main screen. Please, note that depending on the version you have purchased some of these functions may not be available in your configuration. In this case a message will inform you that you need to acquire an additional license.



1.2 Special function "Key learning"

When the "Key learning" special function is selected it is very important to follow the exact directions of the application.

This function will automatically recognize one of the following types of anti theft systems used in your vehicle:

- Separate immobilizer control unit synchronized with the engine control module
- Smart Access System
- Immobilizer system integrated in the engine control module

You will also be asked about existing working keys. If similar master keys are not available you will have an option to reset immobilizer or smart module and to set it in "after sale" mode.

In any case if you have an existing working master key for this vehicle the following programming of new keys will be available without the need to reset the anti theft system.

Please take into account that this function is related only to the transponder part of the key. If you need to program a remote control you should use the main diagnostic screen, to enter the"Main Body" control unit and to press the button "Special".

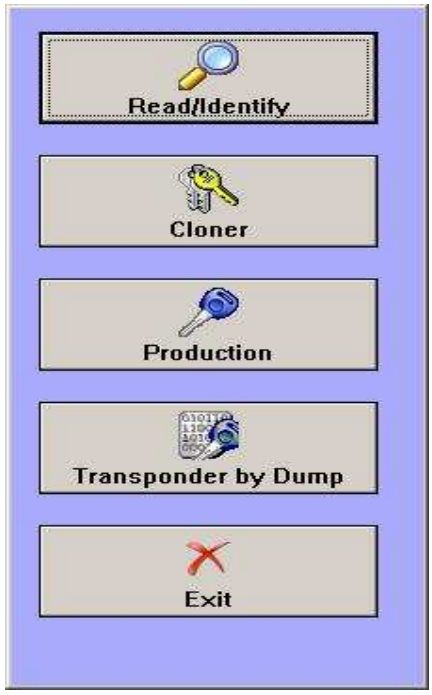
Important:

- Once you start the smart-key learning procedure do not close the driver side door or switch the ignition off until a master key is not learned.
- Once immobilizer has been reset program at least two keys before next attempt for reset of the immobilizer. If you try to reset the immobilizer while it is in key learning state it will be destroyed permanently and you can fix it only by "Dump Tool"
- at least one MASTER key should be registered in the immobilizer system.
- MASTER key should first be programmed i.e. after reset of the immobilizer system the first key programmed should be a MASTER
- In many cases immobilizers need registration of at least of two keys to finalize the learning process

1.3 Special function "Transponder Tool"

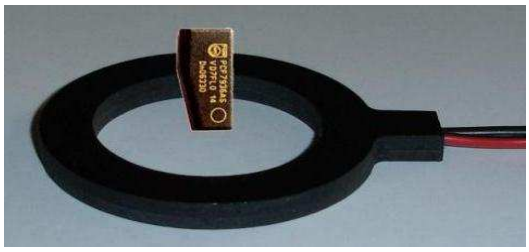
Before usage of special function "Transponder Tool" please be sure that your transponder programmer is connected to the AVDI interface.

When your transponder programmer is detected a list of sub functions will appear – Identification of a key or transponder, Cloning of a key/transponder, Preparation (production) of transponders ready for usage with Toyota/Lexus/Scion vehicles, Programming transponder by the dump of immobilizer/smart system.



Before usage of your programmer please take into account:

- while operating the antenna of the transponder the programmer should be kept away from metal surfaces
- key or transponder should be placed near the antenna to allow proper reading and programming. Find bellow example of some key and transponder positions:



Transponder position should be at 1 cm. from antenna surface.

Regular key example.

Smart key example.

Smart key (like card – Lexus 600).

1.3.1 Identification of a key or transponder

If you have a key or transponder simply place it near the antenna of the programmer and press the “Read/Identify” button. A message about type of your transponder and content programmed will be displayed . If your transponder is some of the known transponder types information about this type (e.g. Texas Crypto 4D type ID67 – Master) will be displayed .

Abrites Diagnostics for Toyota/Lexus/Scion will try to recognize ONLY transponders/keys used in Toyota/Lexus/Scion vehicles. These types are as follows:

- Fixed transponder Texas 4C. This type of transponder consist of only identification number and do not contain any authentication logic.
- ID33 transponders – this is another type of transponders that are using fixed numbers programmed in the transponder and are used for identification by the immobilizer system.
- Crypto transponder Texas 4D. This type of transponder consist of a set of data fields programmable by the user than can be used from immobilizer system to decide whether the key has been programmed in the vehicle. In addition this transponder provides the ability for programming of 40 bits secret keys which can be used by immobilizers to identify the transponder by a special authentication algorithm. Depending on the content of these transponders they can be named as follows: ID67, ID68 and ID70.

  ID67 is intended for usage by Toyota/Scion vehicles.

  ID68 is intended for usage by Lexus vehicles.

  ID70 is intended for usage by Toyota Europe.
- Crypto transponder Texas DST+. Generally this type of transponder is similar to Texas 4D with the exception that it provides a wide range of programmable data memory plus extended authentication algorithm – here the secret key is 80-bits.

  These types of transponders are usually used in the smart systems (keyless keys) and also regular keys also known as G-chips (G-transponders).

1.3.2 Cloning of a key or transponder

With the help of this option you can prepare a fully functional cloning of an existing vehicle's keys.

Supported keys/transponders for cloning are:

- Texas 4C fixed. In the cloned key you should use transponder type TPX1 produced by JMA Company or compatible.
- ID33 fixed. In the cloned key you should use transponder type PCF7935.
- Texas 4D transponders (types ID67, ID68, ID70). You should use an empty (brand new) transponder named TPX2 produced by JMA Company or compatible.

Important:

Currently "Abrites Diagnostics for Toyota/Lexus/Scion" NOT supports Texas DST+ transponders for cloning. This will be an issue of the next software releases.

1.3.3 Preparation of transponders/keys ready for usage with the vehicle

Usually when you need to add an additional key to the vehicle or all keys are lost you need to use some kind of key or transponder.

Transponder inside of the key should be with a special content in order for future programming by diagnostics to be possible.

"Production" utility provides the ability to program an empty (brand new) transponder as at transponder ready for acceptance by the immobilizer system of the vehicle.

Transponders applicable for this utility are virgin Texas 4D transponders or TPX2 transponders.

Only for preparation of "Emergency 4C" key you will need a TPX1 transponder.

While transponder preparation is in progress you have a choice to select what kind of key you need to prepare – master key or sub key and also for what model vehicle it is intended.

Please take into account that the following rules are applicable for all Toyota/Lexus/Scion vehicles:

- at least one MASTER key should be registered in the immobilizer system
- MASTER key should be first programmed i.e. after reset of the immobilizer system first key programmed should be a MASTER
- In many cases immobilizers need registration of at least of two keys to finalize the learning process

We want to point out that in many cases keys ordered from Toyota/Lexus/Scion dealers can not be used after reset of immobilizer system. Reason for this is that these keys in most cases are SLAVE keys and can be used only if an MASTER key has been programmed before. With this utility you can prepare a new Texas 4D transponder as a MASTER key.

Another important issue is that once a transponder is programmed as ID67, ID68 or ID70 it can not be used for second programming i.e. it can not change its type. This is because ID67,ID68 and ID70 transponders are with locked data fields after preparation.

1.3.4 Preparation of a key by dump of immobilizer or smart system of the vehicle

This utility will provide the ability to prepare a key when you have the dump of the immobilizer system.

Supported immobilizer systems are:

- Separate immobilizer boxes (usually EEPROM 93C56,93C66). The latest versions of immobilizers with encrypted dumps are also supported. Genus Keys, virgin Texas 4D transponders or TPX1/TPX2 transponders should be used.
- For immobilizers integrated in the engine control unit (in most cases using Texas 4C or ID33). Genus Keys, Texas 4C or TPX1 transponders should be used.
- Smart access systems (EEPROMs 93C66 or 93C86). Only Genus Keys should be used!

All that is needed from you is to read by some IC programmer the eeprom of your immobilizer/smart module, to load it in the application, it will automatically identify the type of your vehicle and the needed transponder or key for programming. When the key is programmed with the same IC programmer you can program the new dump (modified by application) in the immobilizer/smart module back.

The generated key will work as a MASTER key so you can proceed to add additional keys by diagnostic.

Important note for Smart Systems:

Generated keys will work as master keys when placed near the START/STOP button of the vehicle.

Their remote control will not work.

To program a fully functional key you should use special function “Key learning” when availability of master key (i.e. without reset of the system, simply “add key”) is selected.

This way for programming does not require access to the ID-box of the vehicle which usually is placed at a very hard to access place.

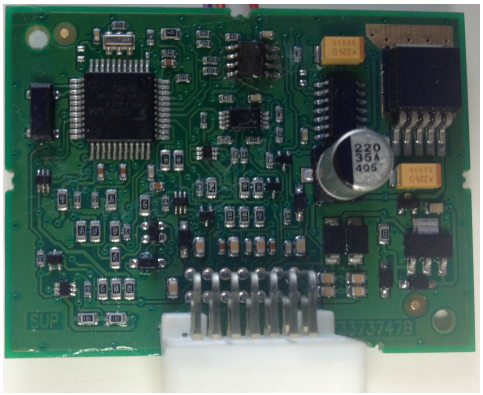
Find bellow pictures of most popular immobilizers and smart systems:

ECU.IMMOBILIZER TOYOTA 89780-0F050
TYPE TY1-2 625371-000
TOKAI RIKA CO., LTD MADE IN JAPAN
T
E11 e11 1-00 2011 97RI-012011
E11 e11 03 1460 10R-021460
Immobilizer control unit.

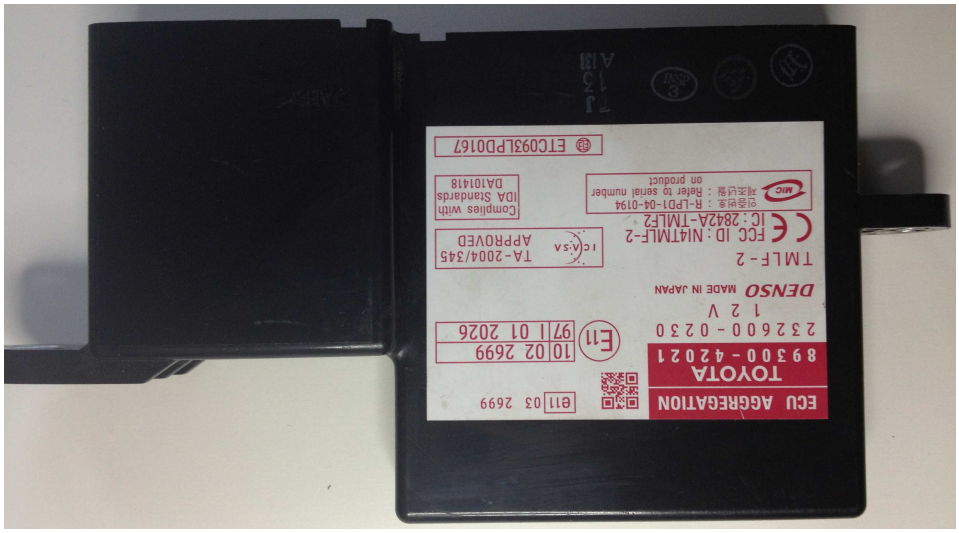
Immobilizer control module Tokai Rika. It is with EEPROM 93C66. Dump is ENCRYPTED!

Immobilizer control module Visteon. It is with EEPROM 93C56:

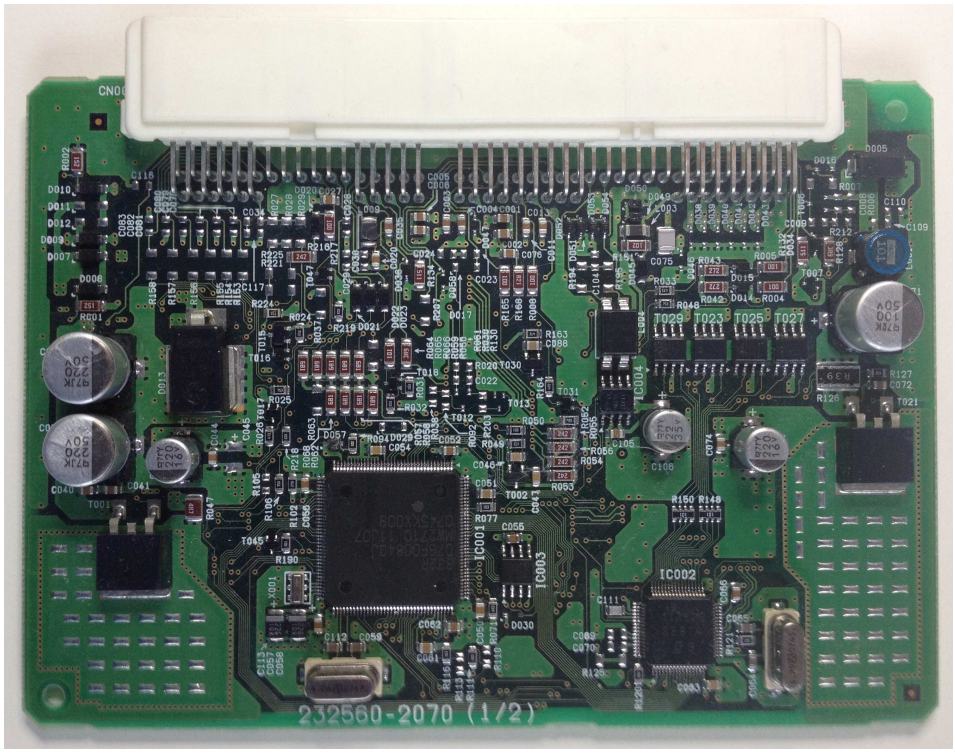
Immobilizer control module Valeo. It is with EEPROM 24C04:



Smart Access Module (so known Certification ECU):



Smart access module – EEPROM 93C86 or 93C66:



ECU-ID code or ID-Box:

ID-Box with EEPROM 93C46:

1.4 Special function "ECU Flasher"

This special function is intended for tuning purposes and allows you to read and program flash memories of engine control units produced by BOSCH – types EDC15 and EDC16.

1.5 Special function "Dump Tool"

This special function will help you when the dump of some electronic control unit is present to reset it in virgin state, to adjust mileage or to clear crash data records from airbag control modules.

All that is needed is to select the type of electronic control unit and function, to load corresponding dump and to press button "Parameters".

Once the dump is modified it should be saved and programmed back in the corresponding control unit.

Refer to Appendix C about available control units and functions available in "Dump Tool".

1.6 Special function "ID-Box Reset"

"ID-Box" control unit is a part of the immobilizer system in the vehicles with a smart access system (keyless keys). "ID-Box" consist synchronization patterns between Smart Access Module and Engine Control Electronics.

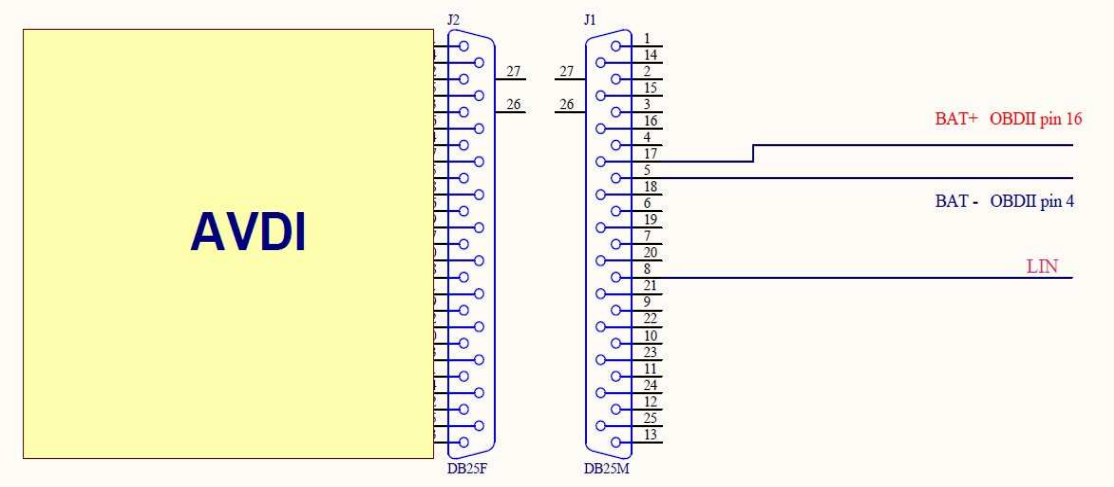
In many cases the replacement of Smart Access Module is linked to the need to reset the ID-box module to it's after sale state (virgin state) to allow acceptance of a new part to the vehicle's security system.

Generally resetting of the Smart Access Module leads to internal reset of the ID-box but in many cases reset by diagnostic of the Smart Access Module is restricted. In this case we have an option to reset the Smart Access Module and ID-box with the help of dump tool. The biggest problem is that the disassembling of an ID-box from a vehicle is a very difficult task. Usually it is placed at a difficult place (in most cases you need to remove the dash board of the vehicle and many other parts).

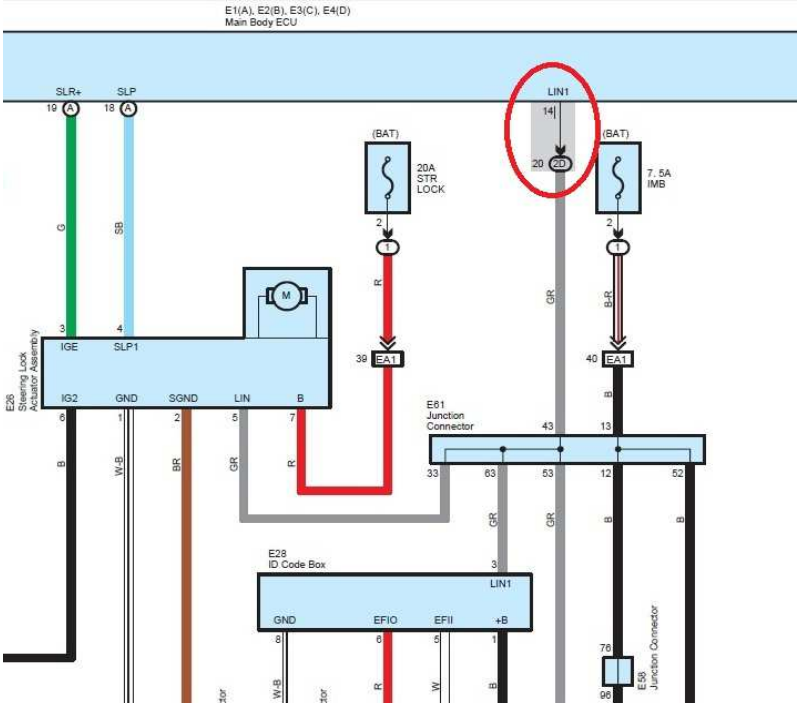
By reason of this we offer an option to reset ID-box by connecting a Smart Access Module.

All that is needed to do this is:

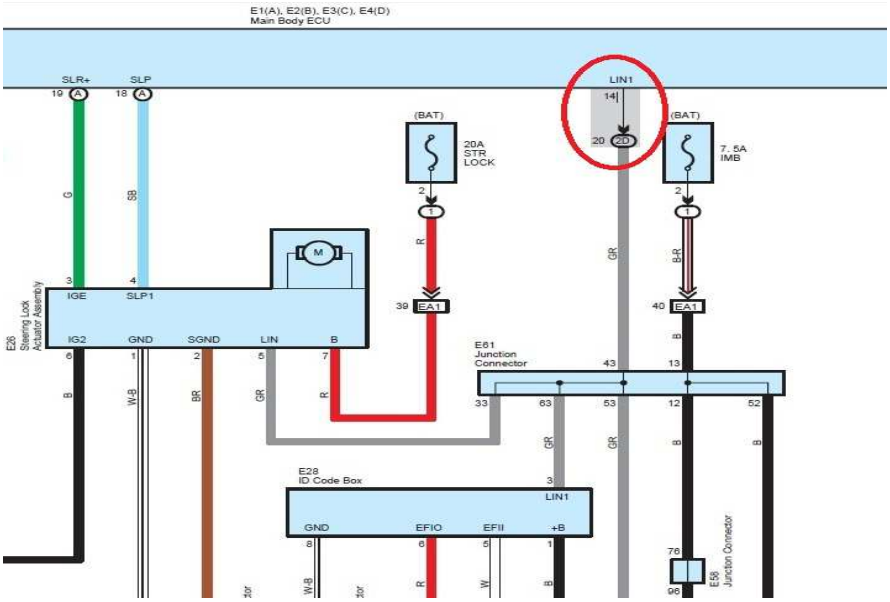
1. You should use a custom cable for connection between the AVDI and vehicle. The AVDI should be powered by this cable and an additional wire should be present for connection to the LIN bus.



2. Disconnect the connector from Smart Access Module
3. Connect the wire for the LIN communication from the AVDI and the connector from step 2 where the LIN bus is located. Please refer to the wiring diagrams for your vehicle to check which pin number from connector the LIN bus is.



Toyota Land Cruiser



Toyota RAV4 2008 UP

4. Provide power supply from vehicle's battery to the AVDI
5. Start Abrites Diagnostics for Toyota/Lexus/Scion and select special function "ID-box reset".
6. Wait until reset is done. Be sure that due to the long process time your computer stays active.

Important:

Be sure that you really need to reset ID-box module of the vehicle!

For key programming purposes this is not needed – you have an option to try reset of the smart system (together with the ID-box) by diagnostics and if this option is restricted you can program a working master key directly in the dump of smart module – refer to special function “Key Learning” and “Transponder Tool”. So access to the ID-box is not needed.

APPENDIX

1.7 Appendix A – Availability Live Data

Electronic Control Unit	**Note**
ABS control module	CAN bus
Cruise Control Module	
Driver Door Control Module	
ECB Gateway	
Engine Control Module	
Electronic Transmission Control Module	
Hybrid Control Module	
Immobilizer	
Master Switch	
Passenger Door Control Module	
Rear Console	
Rear Left Door	
Rear Right Door	
Entry & Smart Access Module	
Steering Pad	

1.8 Appendix B – Special functions available from basic diagnostic session

Function	Control Unit	Note
Immobilizer Reset	Immobilizer	
Register Key	Immobilizer/Smart Module/ECU	
Erase Keys	Immobilizer/Smart Module/ECU	
Synchronize	Immobilizer	Synchronization between immobilizer and smart unit
Smart Module Reset	Entry&Smart Access	
Remote Key Registration	Main Body	Registers remote key
Remote Key Deletion	Main Body	
Steering Lock Synchronization	Entry&Smart Access	Synchronize steering lock electronic with Smart Access Module
ECU Synchronization	Entry&Smart Access	Synchronize engine control module with Smart Access Module
ECT reset	Engine Control Module	Resetting learned values ECT
Leave After Sale	Engine Control Module	Cancel auto learning state (key learning) of the engine control module
Throttle Learn	Engine Control Module	
ABS reset	ABS	Reset learned values - should be used if ABS module or YAW rate/G sensor are replaced
ABS alignment	ABS	Reset learned values of ABS.
Gateway reset	Gateway	Used to reset list with assembled in the vehicle control modules. Useful when some unit have been removed from vehicle (or added).
A/C Servo Motor Init	Air-condition	
EMPS Init	Power Steering	

1.9 Appendix C – Dump Tool available options

- Reset of the immobilizer
  - tokai rika eeprom 93C66 (texas 4D)
  - tokai rika eeprom 93C66 encrypted (texas 4D or G-chip)
  - valeo 24C04 (texas 4D)
  - visteon 93C56
- ID-box reset – 93C46
- Smart Access Module reset – eeprom 93C66 or 93C86
- Engine Control Unit reset (virgin)
- Engine Control Unit mileages recalibration
- Airbag Control Module – crash data clear